Glossary of National Fire and Air Workshop Terms

ACRES BLACK: Area within a fire perimeter that was actually touched by fire.

ACROLEIN: A hazardous air pollutant, emanating from fire smoke.

AEROSOL: Solid particles or liquid droplets that are small enough to be suspended in the air.

AIR QUALITY RELATED VALUE (AQRV): A feature or property of physical or biological property that is (or has potential to be) impacted by air pollution. General categories of AQRV's are: flora, fauna, soil, water, cultural resources, odor and visibility

AIRSHED: A geographic area that, because of topography, meteorology, and/or climate, is frequently affected by the same air mass.

AIRSHED CAPACITY: Process for quantifying the relative emissions contributions by source within a **airshed**.

AMBIENT AIR: The air of the surrounding outdoor environment. The air encompassing a specific geographic area.

ATTAINMENT AREA: An area considered having air quality as good as or better than the National Ambient Air Quality Standards (NAAQS) as defined in the Clean Air Act. Note that an area may be in attainment for one or more pollutants but be a non-attainment area for one or more other pollutants. (See Non-attainment area).

AVAILABLE FUEL: The portion of the total fuel that actually burns.

AVOIDANCE: A smoke emission control strategy that considers meteorological conditions when scheduling prescribed fires in order to avoid incursions into smoke sensitive areas.

BACK TRAJECTORY/TRAJECTORY MODELING: Estimates of the general path air masses may have traveled over the 24 to 96 hours prior to arriving at a particular study location. These estimates of air movements are important to understanding air pollution. The meteorological dynamics that cause air to rise or fall, and that determine its path can affect air quality by carrying air pollutants many miles from their sources. Model e.g.: HYSPLIT4 (HYbrid Single-Particle Lagrangian Integrated Trajectory) Model developed by the Air Resources Laboratory of the National Oceanic and Atmospheric Administration.

BACM (BEST AVAILABLE CONTROL MEASURES): An emission limitation action based on the maximum degree of emission reduction (considering energy, environmental, and
economic impacts) achievable through application of production processes and available methods, systems, and techniques.

BACT (BEST AVAILABLE CONTROL TECHNOLOGY): The control level (or control measures) required for sources subject to PSD - see 40 CFR §52.21(b)(12), or 40 CFR

§51.166(b)(12)

BART (BEST AVAILIABLE RETROFIT TECHNOLOGY): A process under the CAA to evaluate the need and, if warranted, install the most effective pollution controls on an already existing air pollution source.

BENZENE: A hazardous air pollutant. Known carcinogen. Respiratory failure at high concentrations.

BURN SEVERITY: A qualitative assessment of the heat pulse directed toward the ground during a fire. Burn severity relates to soil heating, large fuel and duff consumption, consumption of the litter and organic layer beneath trees and isolated shrubs, and mortality of buried plant parts.

CARBON DIOXIDE (CO2): A colorless, odorless, nonpoisonous gas, which results from fuel combustion and is a normal a part of the ambient air. Atmospheric CO_2 has increased about 25 percent since the early 1800s, with an estimated increase of 10 percent since 1958 (burning fossil fuels is the leading cause of increased CO_2, deforestation the second major cause). The increased amounts of CO_2 in the atmosphere enhance the greenhouse effect, blocking heat from escaping into space and contributing to the warming of Earth's lower atmosphere.

CARBON MONOXIDE (CO): A colorless, odorless, poisonous gas produced by incomplete fuel combustion. Carbon monoxide is a criteria pollutant and is measured in parts per million.

CLASS I AREA: A geographic area designated for the most stringent degree of protection from future air quality degradation. The Clean Air Act designates as mandatory Class I areas each National Park over 6,000 acres and each Wilderness or National Wildlife Refuge over 5,000 acres in existence as of August 7, 1977. Subsequent additions of land to those Class I wildernesses are also considered to be "Class I".

CLASS II AREA: A geographic area designated for a moderate degree of protection from future air quality degradation. Moderate increases in new pollution may be permitted in a Class II area. All Wildernesses designated after August 7, 1977 are automatically Class II Areas, as are all other National Forest System lands that are not Class I. Most areas in the United States that are not Class I are Class II.

CLEAN AIR ACT (CAA or CAAA): A federal law enacted to insure that air quality standards are attained and maintained. Initially passed by Congress in 1963, it has been amended several times, with the majority of changes in August, 1977, and November, 1990.

CONDITION CLASS: An expression of the departure of the current condition from the historical fire regime. Consequently, it is derived from the historical fire regime and the current fire severity. It is used as a proxy for the probability of severe fire effects (e.g., the loss of key ecosystem components - soil, vegetation structure, species; or alteration of key ecosystem processes - nutrient cycles, hydrologic regimes). Consequently, the fire-regime condition class is an index of ecosystem risks attributable to wildland fire.

CONFORMITY: Conformity of Federal actions to a SIP to ensure Federal activities do not interfere with the budgets in the SIPs, do not cause or contribute to new violations, and ensure attainment and maintenance of the NAAQS (see **General Conformity**)

CONSUME: Consume 2.1 is a PC-based, interactive fuel consumption model that predicts total and smoldering fuel/biomass consumption during prescribed fires and wildland fires. Predictions are based on weather data, the amount and fuel moisture of fuels, and a number of other factors.

CONSUMPTION: The amount of a specified fuel type or strata that is removed through the fire process, often expressed as a percentage of the preburn weight.

CRITERIA POLLUTANTS: A group of very common air pollutants regulated by EPA on the basis of criteria (information on health and/or environmental effects of pollution). Criteria air pollutants are widely distributed all over the country. Criteria pollutants are carbon monoxide (CO), lead (Pb), nitrogen dioxide(NO_2), ozone (O_3), particulate matter (PM), and sulfur dioxide (SO_2). There are also a large number of compounds which have been determined to be hazardous which are called air toxics. Ozone and particulate matter are the criteria pollutants of greatest consideration to fire.

E-BAM PARTICULATE SAMPLER: A portable real-time sampler providing data for EPA requirements for automated PM 2.5 and PM 10 measurement.

EMISSION FACTOR: A relationship between the amount of emissions that are released and the activity of the producer. Emission factors are used to predict emission levels for different industries. For fire, the parameter of lbs of pollutant/ton of fuel consumed is used.

EMISSONS BUDGET: A quantitative description of the emissions for a physical or ecological system. The amount of source emissions utilized in a attainment demonstration becomes the “emissions budget.”

EMISSIONS INVENTORY: Emission inventories are quantities of pollutants measured over time. Emission inventories can be compared with air pollutant levels in an area to determine if increased emissions decreases the air quality.

EMISSION FACTOR: The estimated average emission rate of a given pollutant for a given source, relative to units of activity. Emissions rates are stated as “Pounds of emission produced per ton of fuel consumed.”

ENHANCED SMOKE MANAGEMENT PROGRAM (ESMP): A program for fire emissions that considers visibility effects, in addition to health and nuisance objectives, and is based on the criteria of efficiency, economics, law, emission reduction opportunities, management objectives, and reduction of visibility impact.

EXCEEDANCE: Violation of the pollutant levels permitted by environmental protection standards.

F-CAMMS (Fire **C**onsortia for **A**dvanced **M**odeling of **M**eteorology and **S**moke)**:** A coordinated group of regional cooperative centers for high-resolution simulation

modeling of weather, fire & smoke. They are initiated under support from FS Research as part of the National Fire Plan.

FIRE USE: The combination of wildland fire use and prescribed fire application to meet resource objectives.

FCCS (Fuel Characteristic Classification System): A comprehensive set of fuelbeds and fire potentials that provide a method for assigning fuel properties to landscapes across the United States. FCC Release Expected October, 2003

FEDERAL REFERENCE METHOD MONITOR: A minimum set of quality control monitoring samples from which to judge data quality for PM 2.5. It is the responsibility of both the EPA and State and local organizations to assess the quality of the data and take corrective action when appropriate.

FINE PARTICULATES: Aerosols smaller than 2.5 micrometers in diameter. (A micrometer is one millionth of a meter, a human hair is about 70 micrometers in diameter.)

FIRE EMISSION TRACKING: Data and models of fuel consumption, emissions, meteorology, and smoke dispersion; producing predictions of cumulative impacts of agriculture, forest, and range fires – e.g. BLUESKY.

FIRE SEVERITY: A prediction of the likely severity (expressed as a percentage of overstory replacement) of a fire should it burn under the current conditions of the vegetation. The likely fire severity is strongly tied to cover type (e.g., species' tolerance to fire), size class, canopy cover, and slope. Current fire severity is used to derive fire-regime condition class.

FORMADEHYDE: A colorless, pungent, and irritating gas, a hazardous air pollutant, one of those emanating from fire.

FUEL CHARACTERSISTIC CLASS POTENTIALS (FCC POTENTIALS): Three sets of numbers that describes the fuel complex and facilitate communication among users.

1. Fire Behavior Potential: Quantifies potential fire behavior based on estimates of reaction intensity (I_R) and energy release component (ERC), rate of spread (SI), and fireline intensity (BI).
2. Crown Fire Potential: Ranks the potential for fire to reach (torch potential) and carry through the canopy (dependent and independent crown fire potentials).
3. Available Fuel Potential: Available fuel loading partitioned into components expected to be consumed in either the flaming (flame available fuel), or smoldering (smolder available fuel and residual smolder potential) phases of fire.

Fuel Characteristic Classification is a system for classifying wildland fuelbeds according to the set of inherent properties necessary to predict potential fire behavior and effects. The Fuel Characteristic Classification System is being developed by the Fire and Environmental Research Applications team (FERA) of the USDA Forest Service, Pacific Northwest Research Program for the Joint Fire Science Program.

FUELBED: An array of fuels usually constructed with specific loading, depth and particle size to meet experimental requirements; also, commonly used to describe the fuel composition in natural settings.

FUELBED COMPONENTS: Each fuelbed category has a set of unique classes based on specific morphological, chemical and structural features of its constituents. For example, shrubs are grouped into unique sets comprising common features of foliage type, growth habit and accelerant potential. Each physiognomic class has its own unique fuel characteristics. The description of fuelbed category physiognomy identifies the relevant fuelbed components to which fuel characteristics are assigned. Fuelbed components are basic elements that combust differently and have a unique influence on fire behavior and effects.

FUEL LOADING: The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area. This may be available fuel (consumable fuel) or total fuel and is usually dry weight.

GACCS (**Geographical Area Coordination Center):** Comprised of eleven centers across the United States, including Alaska which locate and dispatch additional firefighters and support personnel throughout a geographic area.

GENERAL CONFORMITY: Section 176(c) of the Clean Air Act prohibits Federal entities from taking actions in non-attainment or maintenance areas which do not conform to the State implementation plan (SIP) for the attainment and maintenance of the national ambient air quality standards (NAAQS). Therefore, the purpose of conformity is to (1) ensure Federal activities do not interfere with the budgets in the SIPs; (2) ensure actions do not cause or contribute to new violations, and (3) ensure attainment and maintenance of the NAAQS.

HAPS: Hazardous air pollutants. Ex: mercury.

HC: Hydrocarbons. A group of chemicals containing hydrogen and carbon that often contribute to air pollution as OCs or VOC's. They are involved in forming ozone, and some hydrocarbons are toxic. Term often used interchangeably with VOCs.

HEAT RELEASE RATE: (1) Total amount of heat produced per unit mass of fuel consumed per unit time. (2) Amount of heat released to the atmosphere from the convective-lift fire phase of a fire per unit time.

Hg: Mercury. A hazardous air pollutant; one of those emanating from fire.

INTERAGENCY MONITORING OF PROTECTED VISUAL ENVIRONMENTS (IMPROVE): Interagency **M**onitoring of **Pro**tected **V**isual **E**nvironments, a group of federal agencies using a common set of standards to monitor visibility across the United States. Other nations have also adopted portions or all of the IMPROVE monitoring techniques.

INCREMENTS: Allowable increases in ambient concentrations of sulfur dioxide and particulates from new or existing sources. The amount of allowable increase is dependent on whether the area is designated Class I, Class II, or Class III for PSD.

LIGHT EXTINCTION: The "loss" of light as it travels through the air. Light can be truly lost by being absorbed by gases and aerosols in the air. Light can also be "lost" as it scatters off gases and aerosols.

MAINTENANCE AREA: A geographic region where concentrations of a particular air pollutant no longer exceed the NAAQS. A three year period is required to demonstrate to the EPA that the implementation measures taken will continue these concentrations to be defined an **attainment** area by the EPA.

MESOSCALE: Used to simulate sub-grid scale phenomena not resolved by regional-scale models. The mesoscale ranges as defined by Orlanski (1975).

MIE DATARAM: Dual-wavelength aerosol monitor continuously displays and logs the concentrations and sizes of airborne particulates.

MM5: A fifth-generation mesoscale meteorology model - a research oriented numerical weather prediction model, maintained by the National Center for Atmospheric Research, Mesoscale and Microscale Meteorology Division (NCAR/MMM).

MOBILE SOURCE: A pollution source that moves. Mobile sources are often divided into road sources, including cars, trucks, buses, and motorcycles, and non-road sources like trains, planes, boats, lawnmowers, etc.

MODIS(**M**oderate **R**esolution **I**maging **S**pectroradiometer): Part of NASA's Earth Observing System (EOS). A key instrument aboard the Terra (EOS AM) and Aqua (EOS PM) satellites, it will view the entire surface of the Earth every 1-2 days, making observations in 36 co-registered spectral bands, at moderate resolution (0.25 - 1 km), of land and ocean surface temperature, primary productivity, land surface cover, clouds, aerosols, water vapor, temperature profiles, and fires.

NATURAL BACKGROUND CONDITIONS: An estimate of the visibility conditions at each Federal Class I area that would exist in the absence of human-caused impairment. Conditions substantially unaltered by humans or human activities. As applied in the context of visibility, natural conditions include naturally occurring phenomena that reduce visibility as measured in terms of light extinction, visual range, contrast, or coloration.

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS): Legal limits of atmospheric pollution established by the EPA, as the concentration limits needed to protect all of the public against adverse effects on public health and welfare, with an adequate safety margin. Primary standards are those related to health effects; secondary standards are designed to protect the public welfare from effects such as visibility reduction, soiling, material damage, and nuisances.
NFDRS: National Fire Danger Rating System:

NCEP (National Centers for Environmental Prediction): One of the initial sources of critical meteorological data available to FCAMMS. Previously the National Meteorological Center, a NOAA facility. The source of most of the model output data that appears in GRIB form on the HDS data stream

NEW SOURCE REVIEW: A review of a new facility that has the potential to emit air pollutants in amounts specified by law. The review is done to establish the impact of the pollution, and the options available to control that pollution

NEPHELOMETER: An instrument that measures the amount of light scattered by fine particles suspended in the air.

NFDRS (National Fire Danger Rating System): A multiple index system developed to provide information about current and predicted fire danger conditions.

NITROGEN OXIDES (NOx): Gases formed from atmospheric nitrogen and oxygen when combustion takes place under conditions of high temperature and pressure. Nitrogen Oxides are primary air pollutants, which can be harmful in themselves, as well as act as precursors of photochemical oxidants (particularly ozone) and acidic deposition. NOx often has a reddish-brown color.

NON-ATTAINMENT AREA (NAA): A geographic region where concentrations of a particular air pollutant exceed the NAAQS. A particular location may be non-attainment for more than one pollutant.

OC (organic carbon): Organic **C**arbon: carbon combined with other elements to form complex compounds, often given off by plants and most human activities. A fire contribution to PM2.5.

OZONE: A pungent, colorless, toxic gas that contributes to photochemical smog. No sources directly produce ozone; it is created when nitrogen oxides, hydrocarbons, and volatile organic compounds (VOC's) mix and are exposed to sunlight.

PAHs (Polynuclear Aromatic Hydrocarbons): A hazardous air pollutant emanating from fire.

PARTICULATE MATTER (PM): Any liquid or solid particles that are or have been airborne. "Total suspended particulates" as used in air quality management are those particles suspended in or falling through the atmosphere. Generally they range in size from 0.1 to 100 microns.

PHOTOCHEMICAL POLLUTANT: Any pollutant produces by photochemical reactions. The most common photochemical pollution involves the ultraviolet portion of sunlight, nitrogen oxides, and certain hydrocarbons. A wide variety of new products are produced, including ozone; many of which are harmful to plants and animals.

PM-10: Particulate Matter less than 10 micrometers. Particles this size and smaller have been shown to cause problems with human health.

PM-2.5: Particulate Matter less than 2.5 micrometers. Particles this size and smaller have been shown to impact visibility as well as incur greater threats to human health than PM-10.

POINT SOURCE: Any source that emits air pollutants through an identifiable stack or a specific source of air pollution.

PRESCRIBED FIRE: Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition. This term replaces management ignited prescribed fire.

PREVENTION OF SIGNFICANT DETERIORATION (PSD): A program mandated by the Clean Air Act to prevent air quality and visibility degradation, and to remedy existing visibility degradation. Before the construction of certain new pollution sources is approved, they must apply for and receive a PSD permit from the appropriate air regulatory agency. The Forest Service has input in to this PSD permitting process by providing comment to air regulatory agencies on potential source impacts to AQRV's.

RAYLEIGH SCATTERING: The scattering of light by particles much smaller than the wavelength of the light, *e.g.*, molecular scattering in the natural atmosphere.

RAWS (Remote Automated Weather Station): A special remote fire weather observation station which takes timed measurements of the various weather factors used to calculate fire danger and behavior. These stations usually transmit data via satellite telemetry to the National Interagency Fire Center for distribution to fire managers nation-wide.

RAZU: The online burn reporting system used by members of the Montana/Idaho Airshed Group. ..allows members to build preseason burn-lists directly into the program's master database, propose burns on a daily basis and report accomplishments on burns that they conduct.

REASONABLE PROGRESS: Refers to progress in reducing human-caused haze in Class I areas under the national visibility goal. The Clean Air Act indicates that "reasonable" should consider the cost of reducing air pollution emissions, the time necessary, the energy and non-air quality environmental impacts of reducing emissions, and the remaining useful life of any existing air pollution source considered for these reductions

REASONABLY AVAILABLE CONTROL MEASURES (RACM): Developed by EPA that apply to wood combustion, fugitive dust, and prescribed and silvicultural burning in and around "moderate" PM10 non-attainment areas. RACM is designed to bring an area back into attainment and uses a smoke management program that relies on weather forecasts for burn/no-burn days.

REGIONAL HAZE VISIBILITY IMPAIRMENT: Any humanly perceptible change in visibility (light extinction, visual range, contrast, coloration) from that which would have existed under natural conditions, caused predominantly by a combination of many sources from, and occurring over, a wide geographic area.

REGIONAL HAZE RULE (RHR):

- July 1, 1999, EPA promulgated rules for the Regional Haze Regulations Rules are designed to address the National Visibility Goal
- § 169A of the Clean Air Act sets as a national goal "*the prevention of any future, and remedying of any existing impairment of visibility, in mandatory class I areas which impairment results from manmade air pollution."*

REGIONAL PLANNING ORGANIZATIONS (RPOs): Five regional planning organizations that address regional haze and related issues. These organizations will first evaluate technical information to better understand how their States and Tribes impact national park and wilderness areas (Class I areas) across the country, and they will then pursue the development of regional strategies to reduce emissions of particulate matter and other pollutants leading to regional haze.

- WRAP: Western Regional Air Partnership
- CENRAP: Central States Regional Air Partnership
- MRPO: Midwest Regional Planning Organization
- MANE-VU: Mid-Atlantic/Northeast Visibility Union
- VISTAS: Visibility Improvement State and Tribal Association of the Southeast

SENSITIVE RECEPTORS: An element of an AQRV that is most sensitive to or first modified by anthropogenic air pollution. For example, a sensitive receptor for visibility (an AQRV) might be a particular view. Potential human-caused changes to that view might be changes in sensitive receptor indicators such as contrast, visual range, or coloration. Another example would be a sensitive receptor for water. Potential human-caused changes to it could affect sensitive receptor indicators such as pH, ANC, metals concentrations, other toxics. dissolved-oxygen concentrations, nutrients, or anion and cation concentrations.

SENSITIVE-RECEPTOR INDICATOR: A measurable physical, chemical, biological, or social characteristic of a sensitive receptor. See definition above for examples.

SMOKE MANAGEMENT PLAN (SMP): A standard framework of requirements and procedures for managing smoke from prescribed fires, typically developed by States or Tribes with cooperation from stakeholders

STANDARD VISUAL RANGE: An index used to quantify visibility conditions, typically expressed in kilometers. Technically, it is the distance at which a large black disappears from view above the horizon.

STATE IMPLEMENTATION PLANS (SIPS or S/TIPS): Subset of a State's Air Agency Rules. Those rules dealing with the attainment and maintenance of NAAQS. Includes every guideline letter, graph, table, legal & regulatory opinion, decision, and emission budget in a State's Air Agency files dealing with the attainment and maintenance of NAAQS.

SULPHUR DIOXIDE (SO2): A gas that is a common industrial air pollutant. SO2 is easily transformed into sulfate in the atmosphere. Sulfate scatters light efficiently, thereby resulting in visibility degradation. It also can convert into acid droplets, consisting primarily of sulfuric acid.

TRANSMISSOMETER: An instrument that measures the amount of light extinction over a specified path length.

VENTILATION INDEX: An index that describes the potential for smoke or other pollutants to ventilate away from its source. Also called clearing index. It is the product of mixing height and the mean wind within the mixed layer trajectory wind.

VENTILATION CLIMATE INFORMATION SYSTEM: Assessing values of air quality and visibility at risk from wildland Fires. Part of the Fire and Environmental Research Applications (FERA) team of the USDA Forest Service, Pacific Northwest Research Station in Seattle, Washington.

VOC's (Volatile Organic Carbons): These are one of the precursors of ozone formation. A carbon-containing material that evaporates and may form *OC aerosols.*

Wildfire - An unwanted wildland fire. This term was only included to give continuing credence to the historic fire prevention products. This is not a separate type of fire under the new terminology.

WFU (WILDLAND FIRE USE): The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in Fire Management Plans. Wildland fire use is not to be confused with "fire use," which is a broader term encompassing more than just wildland fires.

WUI (WILDLAND-URBAN INTERFACE): The line, area, or zone, where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel.

Models

BEHAVE: Fire Behavior Prediction and Fuel Modeling System gathers available fire models into a system that is driven by direct user input. The fire modeling capabilities will be significantly expanded and the user interface will be vastly improved with the updated Behave Plus: Fire Modeling System

BLUESKY: A smoke modeling framework that links together data and models of fuel consumption, emissions, meteorology, and smoke dispersion; producing real-time predictions of cumulative impacts of agriculture, forest, and range fires.

CALPUFF: a non-steady-state modeling system being used for a wide variety of air quality modeling studies, including:

- Near-field impacts in complex flow or dispersion situations
    - complex terrain
    - stagnation, inversion, recirculation, and fumigation conditions
    - overwater transport and coastal conditions
    - light wind speed and calm wind conditions
- Long range transport
- Visibility assessments and Class I area impact studies
- Criteria pollutant modeling, including application to State Implementation Plan (SIP) development
- Secondary pollutant formation and particulate matter modeling

- Buoyant area and line sources (e.g., forest fires and aluminum reduction facilities)

The CALPUFF modeling system has 3 main components: CALMET (a diagnostic 3-D meteorological model), CALPUFF (the transport and dispersion model), and CALPOST (a post-processing package). Each of these programs has a graphical user interface (GUI). In addition to these components, there are several other processors that may be used to prepare geophysical (land use and terrain) data in many standard formats, meteorological data (surface, upper air, precipitation, and buoy data), and interfaces to other models such as the Penn State/NCAR Mesoscale Model (MM5).

EMISSION PRODUCTION MODEL (**EPM**)**:** Emissions Production Model predicts air pollutant emissions source strength, heat release rate, and plume buoyancy consistently for all fire environments and fuel types. It requires an estimate of flaming and smoldering consumption, and a stylized description of ignition pattern. EPM then calculates timed emission rates for gases, particles, and heat. integrating fuel characteristics, predicted fire behavior (burn plan), three-stage combustion process, and the application of emission factors.

FARSITE: A fire growth simulation model. It uses spatial information on topography and fuels along with weather and wind files. FARSITE incorporates the existing models for surface fire, crown fire, spotting, and fire acceleration into a 2-dimensional fire growth model. FARSITE runs under Microsoft Windows operating systems (Windows 3.1x, 95, NT) and features a graphical interface. Users must have the support of a geographic information system (GIS) to use FARSITE because it requires spatial landscape information to run. ms

FASTRACS: Fuel Analysis, Smoke Tracking, and Report Access Computer System. It provides a system for planning, tracking, and reporting fuels management related activities. The program introduces two new approaches:

- Identification of tasks based on “Projects, Boundary Units, and Activities”—a familiar sounding set of terms used in a program-specific way to organize and manage traditional fuels management work.
- Implementation of a new methodology for estimating fuel loadings and calculating consumption and emissions based on Fuels Characterization Classes (FCC).

FIRE EFFECTS TRADEOFF MODEL (FETM):

Landscape-scale disturbance model

•Designed to simulate the long-term *effects* of management activities and natural disturbances on vegetation:
•Vegetation composition
•Wildland fire acres burned
•Residue loading and consumption
•Smoke production
•Fire and fuel treatment costs

Also designed to demonstrate *tradeoffs* between different types of disturbances (for example, prescribed fire vs. wildfire acres and emissions). Focus is on fire behavior and effects (by vegetation class) and for the entire landscape including:

•Stochastic—Number of fire starts per year treated as random variable

•Dynamic—Deals with annual changes over any future time period, 1 to ~300 years
•Non spatial—Results are tracked by vegetation class (FCC), without regard to location
•Public domain software
•Designed for use by any organization (federal, state, private)

FOFEM5: First Order Fire Effects Model: A easy-to-use computer program for predicting effects of prescribed fire and wildfire. FOFEM predicts fuel consumption, smoke production and tree mortality. Area of applicability is nationwide on forest and non-forest vegetation types. FOFEM also contains a planning mode for prescription development.

PFIRS: (Prescribed Fire Ignition Reporting System): A computer system developed by the state of California that will allow participating agencies to enter information on the location, size, date, and estimated emissions of each prescribed burn. The information will help coordinate their ability to meet local air quality requirements and adjust the timing of individual projects to reduce cumulative air quality impacts.

SMOKE IMPACT SPREADSHEET MODEL (SIS):

•Simple-to-use, screening level emissions and dispersion modeling system.
•Development sponsored by USDA Forest Service Region 1 Air Quality Program
•Uses state-of-the-art modeling techniques (e.g., FOFEM5 emissions model, CALPUFF dispersion model).
•Goal to minimize development costs by using existing tools rather than creating an entirely new application.
Microsoft Excel provides user interface
•First Order Fire Effects Model (FOFEM5) provides front-end emissions calculator
•CALPUFF performs plume rise and downwind dispersion calculations
•CALPOST averages the CALPUFF outputs